UURI EARTH SCIENCE LAB

PROJECT ROOSEVELT
DRILL HOLE UNIV. of UTAH DDH 1A
DEPOSIT TYPE GEOTH.
LOGGED BY J. B. HULEN — JULY, AUG. 1977

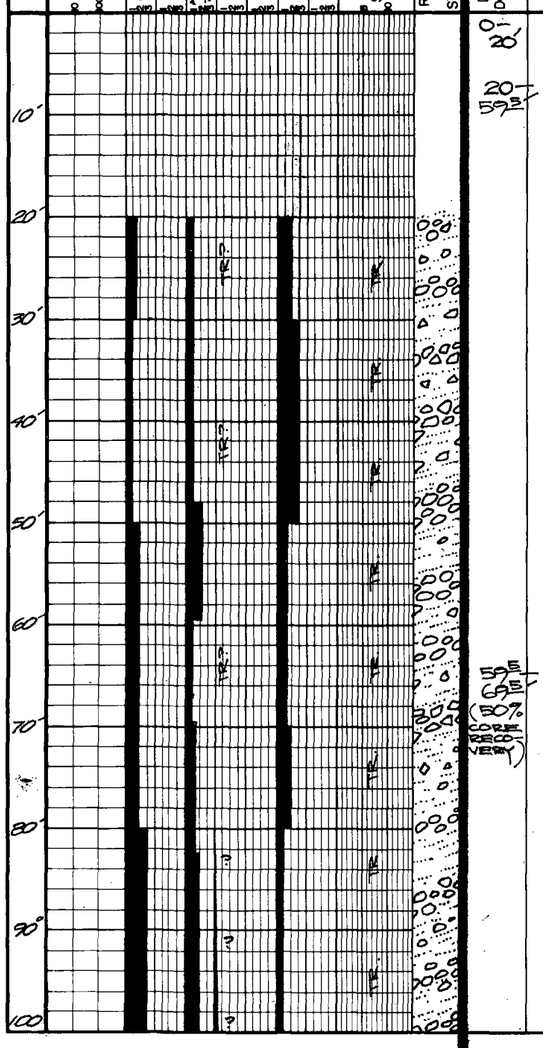
DATE STARTED
DATE COMPLETED
DRILLING CO.
FINAL DEPTH (m. ft.)
COLLAR ELEV. (m. ft.)
CO-ORDINATES LAT. LON.
GRID 3866 m N 24 m E
T 27S R 9W SEC. 4

GEOPHYSICAL LOGS

CORE SIZE (mm. in.)	FROM (m. ft.)	TO	LOG RUN	DEPTH (m. ft.)	DATE	COMPANY

SHEET No 1 OF 5

GRAPHIC LOGS*: SCALE (ft.); FRACTURE INTENSITY (No. FRACTURES / ft.); ALTERATION (CLAY, CHLOR./EPID., ALUNITE/JARO-SITE, SER./ILLITE, KSPAR, SILICA, $CO_3^=$ — 0 NO, 1 WEAK, 2 MODERATE, 3 STRONG); TOTAL SULPHIDES (vol. %); ROCK TYPE & STRUCTURE



59.5
69.5
(50% CORE RECOVERY)

* NOTE: GRAPHIC LOGS & GEOLOGIC NOTES NOT AT SAME SCALE

GEOLOGIC NOTES* (Use also for general comments)

DOWN HOLE LOCATION: DISTANCE DOWN HOLE (ft.)	ELEVATION	ROCK TYPE	DESCRIPTION: MINERALOGY, ALTERATION, TEXTURES, GRAIN SIZE, FRAGMENT SIZE	MINERALIZATION: DISTRIBUTION (Massive, Disseminated, Veinfill, Replacement) / TYPE (Hypogene, Supergene, Ore and Limonite Mineralogy)	STRUCTURE: DOWN HOLE DIST. (m. ft.)	FOLIATION ∢ WITH CORE	BEDDING ∢ WITH CORE	FRACTURE ∢ WITH CORE	DESCRIPTION OF STRUCTURES (Post or Pre-Ore (Evidence)	FRACTURE INTENSITY (No PER METRE)	DOWN HOLE SURVEY DATA: DEPTH (ft.) / INCLINATION / BEARING	THIN & POLISHED SECTIONS: DEPTH (ft.) / SAMPLE NUMBER
0-20'		Qal?	NO CORE	20-app. 48': MINOR, ERRATICALLY DISTRIBUTED NATIVE SULFUR (w/tr. REALGAR)					ALTERED ALLUVIUM TENDS TO CRUMBLE RATHER THAN FRACTURE			
20-59.5'		ALTERED ALLUVIUM	SILTY TO SANDY GRAVEL; ANGULAR-SUBANG. FRAGS OF ALT. FSP, QTZ., GRANITIC RX., & POSS. VOLC. RX (INTENSITY OF ALTN. PRECLUDES ACCURATE I.D.) FR. << 1 mm. TO AT LEAST 5 cm. MAX. DIMENSION; OVERALL BLEACHED, PUNKY, CRUMBLY ASPECT; LOCALLY DENSE AND PORCELLANEOUS IN IRREGULAR PATCHES; APPEARS TO BE A V. FINE-XLINE AGGREGATE OF SILICA, CLAY, (AND POSS. TR. ILLITE) W/ALUNITE; POROSITY VARIABLE FR. <1%-20%—VUGS ARE IRREG., TEND TO BE ELONGATE, UP TO 15 mm. MAX. DIMENSION, COMMONLY PARTIALLY LINED W/BOTRYOIDAL OPAL & CLAY (OCC. W/tr. S & As_2S_3); A FEW (10/meter?) VUGGY, IRREGULAR CLAY-OPAL VNLTS. up to 20 mm. WIDE (AVG. ~ 1/2 mm. WIDE)	SULFUR OCCURS AS: ① DISS., IRREG. MASSES OF SUBHEDRAL XLS. AVG. 1 mm. DIA. (UP TO 3 mm. DIA.)—COMMONLY INTERCONNECTED BY TINY VNLTS. ② SUBH. XLINE CRUSTS ON AND INTERGROWN WITH OPAL & CLAY IN VNLTS. & PARTIALLY LINING VUGS —REALGAR APPEARS TO BE CRYPTOXLINE. OCCURS IN AMORPHOUS CLOTS & STAINS AVG. <1 mm. DIA. (UP TO 2 mm. DIA.) —RARE RELICT PYRITE GRAINS LOCALLY PRESENT							W.R. SILL* SAMPLES (core intact) 25.5-26.15' 88.5-89.30' 99.4-99.95' 123-123.40' 155.85-156.10' 167.85-168.25' 192.3-192.9' 208.05-208.55' 211-211.5'	
59.5-69.5'		ALTERED ALLUVIUM	SAME AS ABOVE, EXC. 15-20% POROSITY, PRIMARILY DUE TO SOLN. OF FSP. FRAGS. & FSP. PORTIONS OF GRANITIC FRAGS, RATHER THAN IRREG. VUGS AS ABOVE. frothy latticework in dissolved fsp. xl. (silica-clay boxwork)	4% LIMONITE, PREDOMINANTLY POWDERY REDDISH-BRN. HEMATITE W/MINOR GOE. & HEM., AS: ① DISS. ANH. GRAINS, AVG. <0.1 mm. DIA. ② AS DENSE TO LOOSE AGGREGATES OF THESE GRAINS UP TO 30 mm. (AVG. ~ 2 mm) MAX. DIMENSION. ③ AS RARE IRREG., DISCONTINUOUS VNLTS. SUB// TO BEDDING, UP TO 10 mm. (AVG. <1 mm) WIDE COMPOSED OF THE MASSES DESCRIBED ABOVE.							A. TRIPP SAMPLES (core missing) 69.5-70' 118.25-118.35' 165-165.75' 201-202.4' 210.5-211' (1/2 core intact 201-201.5')	

* THERMAL CONDUCTIVITY

UURI EARTH SCIENCE LAB

SHEET Nº _____ OF _____

PROJECT _____

DRILL HOLE _____

DEPOSIT TYPE _____

LOGGED BY _____

CO-ORDINATES LAT. _____ LON. _____

GRID _____ N _____ E _____

T _____ R _____ SEC. _____

COLLAR ELEV. _____ (m. ft.)

DRILLED DEPTH _____ (m. ft.)

CASING

SIZE (mm. in.)	DEPTH (m. ft.)	CEMENTED

COMPLETION (SCREENS, PERFORATIONS, PLUGS, PRODUCTION PACKERS) _____

PRODUCTION (STEAM, WATER, PRESSURE, TEMP., INTERVAL OPEN) _____

SCALE (m. ft.)	INTERVAL From	INTERVAL To	Actual Length	Recovery Length	% Core Recovery	ASSAYS (Assay values shown as p.p.m. unless noted otherwise.) Sample Nº									Weighted Averages	COMPOSITE ANALYSES (Assay values shown as p.p.m. unless noted otherwise.) Composite Nº											ESTIMATES OF ORE MINERALOGY (Based on assay sample intervals.) Total Sulphide Vol. %	py Vol. %	cp Vol. %	cc Vol. %	sp. Vol. %	gn Vol. %					ROCK STRENGTH Strong Mod. Strong Mod. Weak Weak	BULK S.G. Down Hole Dists.	BULK S.G. Specific Gravity

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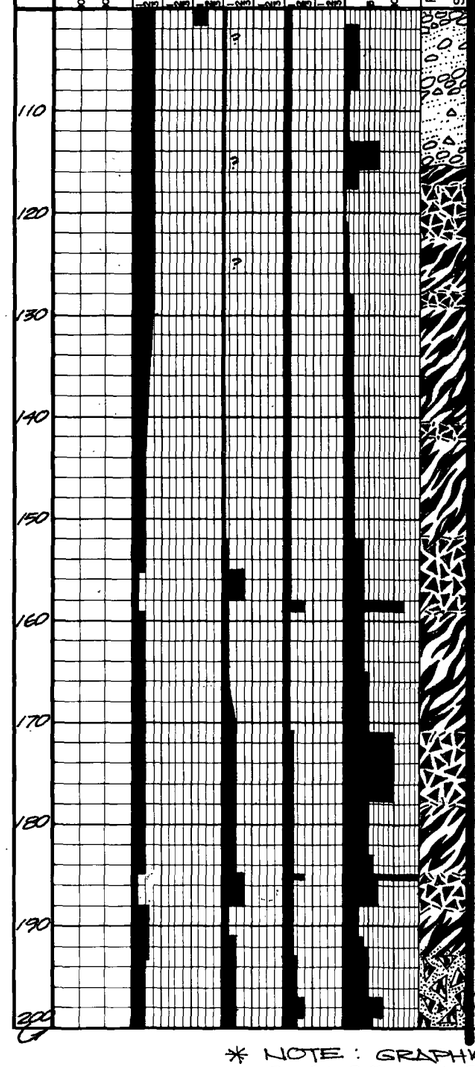
GEOPHYSICAL LOGS

CORE SIZE (mm. in.)	FROM (m. ft.)	TO	LOG RUN	DEPTH (m. ft.)	DATE	COMPANY

SHEET No. 2 OF 5

GRAPHIC LOGS*



DOWN HOLE LOCATION

DISTANCE DOWN HOLE (m. ft.)	ELEVATION
69.5 – 71.5	
71.5 – 82.4	
82.4 – 90.6	
90.6 – 101.7	
101.7 – 108 (16% CORE REC.)	
108 – 113 (10% CORE REC.)	

GEOLOGIC NOTES* (Use also for general comments)

ROCK TYPE	DESCRIPTION: MINERALOGY, ALTERATION, TEXTURES, GRAIN SIZE, FRAGMENT SIZE.	MINERALIZATION: DISTRIBUTION (Massive, Disseminated, Veinfill, Replacement.) / TYPE (Hypogene, Supergene, Ore and Limonite Mineralogy)	STRUCTURE: DOWN HOLE DIST. (m. ft.)	FOLIATION ∢ WITH CORE	BEDDING ∢ WITH CORE	FRACTURE ∢ WITH CORE	DESCRIPTION OF STRUCTURES (Post or Pre-Ore (Evidence)	FRACTURE INTENSITY (No. PER METRE)	DOWN HOLE SURVEY DATA: DEPTH (m. ft.)	INCLINATION	BEARING	THIN & POLISHED SECTIONS: DEPTH (m. ft.)	SAMPLE NUMBER
ALTERED ALLUVIUM	SAME AS 59.5–69.5'	SAME AS 59.5–69.5', EXC. ~0.3% HEMATITIC LIMONITE											
ALTERED ALLUVIUM	SAME AS 59.5–69.5', EXC. TO 80' ROCK IS HARDER, MORE DENSE, W/MORE OBVIOUS POR-CELLANEOUS ALUNITE. ~15–20% POROSITY TO 78.4'; <5% TO 82.4'.	LIMONITE, SAME AS 59.5–69.5', EXC. GOETHITE AND JAROSITE MORE ABUNDANT — PATCHES OF HEM. AND OF GOE-JAR. TEND TO BE MUTUALLY EXCLUSIVE. 79–82.4': 7% LIMO. 71.5–79': 3% LIMO. (LOCAL BANDS & PATCHES W/UP TO 20% LIMO.)											
ALTERED ALLUVIUM	SAME AS 20–59.5', EXC. 4–5% POROSITY, AVG. 4–5% (UP TO 10%) LT. YELLOWISH-GRAY PULVERULENT TO POR-CELLANEOUS JAROSITE-ALUNITE, ALMOST TO-TALLY INTERSTITIAL TO LARGER FRAGMENTS.	<0.1% HEM., TR. GOE. TEXTURALLY SIMILAR TO 59.5–69.5'											
ALTERED ALLUVIUM	SAME AS ABOVE, EXC. FSP. FRAGS. ARE EXTEN-SIVELY STAINED PINK TO MAROON BY FINELY DIVIDED HEMATITE, RARE RELICT FRESH-FSP. LOCALLY PRESENT. —OVERALL AVG. 7% JAROSITE-ALUNITE (VARIES FR. <1–10%)	←											
ALTERED ALLUVIUM	SAME AS 20–59.5', EXC. NO ALUNITE, ~2% POROSITY, MOSTLY UNOXIDIZED	PYRITE 3%, TEXTURALLY SIMILAR TO HEMATITE FR. 59.5–69.5', EXC. GRAINS ARE PREDOMINANTLY SUBHEDRAL, AVG. ~0.1 MM.											
ALTERED ALLUVIUM	SAME AS 20–59.5', EXC. NO ALUNITE, ~2% POROSITY, MOSTLY UNOXIDIZED	SAME AS ABOVE, EXC. <1% PY., ~1% JAROSITE TEXTURALLY SIMILAR TO PYRITE											

* NOTE: GRAPHIC LOGS & GEOLOGIC NOTES NOT AT SAME SCALE

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GEOPHYSICAL LOGS

CORE SIZE (mm. in.)	FROM (m. ft.)	TO	LOG RUN	DEPTH (m. ft.)	DATE	COMPANY

SHEET No. 3 OF 5

GRAPHIC LOGS*: SCALE (feet); FRACTURE INTENSITY; FRACTURES (ft.); ALTERATION (1 WEAK, 2 MODERATE, 3 STRONG): CLAY, CHLOR. EPID., BIO., SER. (ILLITE), K SPAR, SILICA, CO_3; TOTAL SULPHIDES (vol. %); ROCK TYPE & STRUCTURE

END OF HOLE

DOWN HOLE LOCATION: DISTANCE DOWN HOLE (ft.)	ELEVATION	ROCK TYPE	GEOLOGIC NOTES* (Use also for general comments): DESCRIPTION — MINERALOGY, ALTERATION, TEXTURES, GRAIN SIZE, FRAGMENT SIZE	MINERALIZATION — DISTRIBUTION (Massive, Disseminated, Veinfill, Replacement.)	MINERALIZATION — TYPE (Hypogene, Supergene, Ore and Limonite Mineralogy)	STRUCTURE — DOWN HOLE DIST. (m. ft.)	FOLIATION ∢ WITH CORE	BEDDING ∢ WITH CORE	FRACTURE ∢ WITH CORE	DESCRIPTION OF STRUCTURES (Post or Pre-Ore (Evidence))	FRACTURE INTENSITY (No. PER METRE)	DOWN HOLE SURVEY DATA: DEPTH (m. ft.)	INCLINATION	BEARING	THIN & POLISHED SECTIONS: DEPTH (m. ft.)	SAMPLE NUMBER
113–115⁸		ALTERED ALLUVIUM	SAME AS 20–59⁵, EXC. NO ALUNITE, ~2% POROSITY, MOSTLY UNOXIDIZED.	SAME AS 101⁷–108, EXC. 7% PYRITE												
115⁸–117⁶		ALTERED GNEISS (BTE.–QTZ.–FSP. PROMINENTLY BANDED)	... FINE–MED. XLINE. LENSOID MASSES OF PARTIALLY–TOTALLY ALTERED FLAKY BIOTITE, UP TO AT LEAST 80 MM. X 15 MM. IN X-SECTION; PROMINENT STREAKY TEXTURE LOCALLY PRESERVED; UNOXIDIZED TO 117³, PARTIALLY OXIDIZED & BLEACHED TO 117⁶; FSP. THROUGHOUT ALT. TO MONTM.–KAOLINITE.	OVERALL 3% PY, TEXTURALLY SIMILAR TO 101⁷–108; SLIGHT OXDN. OF PY. TO GOE.–JAR BELOW 1.						>50?					
117⁶–122		ALTERED FLT. GOUGE & BRECCIA	... CHAOTIC JUMBLE OF QTZ., ALT. FSP. & BTE. & GNEISSIC FRAGMENTS; THESE ALTERED TO CLAY (BTE. ONLY PARTIALLY ALTERED); RARE OPAL VNLTS. < 1 MM. WIDE; >75% OXIDIZED TO 121'; SOMEWHAT LESS OXDN. TO 122'	~1% PY, AS ABOVE, TO 121'; 1.5% PY TO 122'; PY IS PARTIALLY OXIDIZED TO GOETHITE.												
122–143.6		ALTERED GNEISS (BTE.–QTZ.–FSP. (PROMINENTLY BANDED)	SAME AS 115⁸–117⁶; ROCK IS OVERALL A FINE (< 1 mm.) TO MED. (2-3 mm.)– XLINE AGGREGATE OF BTE. (PARTIALLY TO TOTALLY ARGILLIZED) FSP. (>95% ARGILLIZED) & QTZ., W/ LOCALLY PROMINENT PRESERVED GNEISSIC TEXTURE; CLAYS APPEAR TO BE MONTM. & KAOLIN ① MONTM.(?) IS A WAXY, YELLOWISH TO GREENISH–VARIETY (-IES?) PARTIALLY REPLACING BIOTITE & FSP. IN IRREG. PATCHES ② KAOLIN IS PURE WHITE, INTERGROWN W/ MONTM.(?) REPLACING FSPS. (MUCH RARER THAN MONT.) ③ ILLITE OR SER. (BLEACHED BIOTITE?) INTERGROWN W/ BOTH–TYPES OF CLAY, BUT IRREGULARLY DISTRIBUTED & UNCOMMON	OVERALL AVG. ~2% PYRITE, AS DISS., GENERALLY SUBH. GRAINS < 0.1 MM. DIA., AND AS DENSE TO LOOSE AGGREGATES OF THESE GRAINS UP TO 5 MM. (AVG. < 1 MM.) IN DIA. — ALSO AS SCATTERED GRAINS & GRAIN AGGREGATES W/ CLAY IN STKWK. VNLTS. PY IS COMMONLY TARNISHED TO DULL BRONZE, REDDISH–BRONZE, & BLUE TO GRAY (CC IN PART?)					DIFFICULT TO ESTIMATE FRACTURE DENSITY; CORE IS COATED W/ THICK CLAY JACKET, BUT PROB. > 50 FRACS./m. FLTS. 128–129' 141–142' 143–143.6'	>50?					

CLAYS & ILLITE ALSO OCCUR IN COMMON STOCKWORK VNLTS. & FILMY FRACTURE COATINGS, WITH– AND WITHOUT SULFIDES (PARAGENESIS UNCERTAIN)

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DRILL HOLE: UNIV. of UTAH DDH 1A
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LOGGED BY: J. B. HULEN

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GEOPHYSICAL LOGS

CORE SIZE (~~mm.~~ in.)	FROM (~~m.~~ ft.)	TO	LOG RUN	DEPTH (~~m.~~ ft.)	DATE	COMPANY

SHEET No. 4 OF 5

SCALE (m. ft.)	GRAPHIC LOGS* (Fracture Intensity; Fractures/ft.; Alteration: Clay, Chlor./Epid., Ser./Lilite, K-Spar, Silica, CO_2 — Weak, Moderate, Strong; Total Sulphides (vol.%))	ROCK TYPE & STRUCTURE	DOWN HOLE LOCATION: Distance Down Hole (m. ft.)	Elevation	ROCK TYPE	GEOLOGIC NOTES* (Use also for general comments): DESCRIPTION — Mineralogy, Alteration, Textures, Grain Size, Fragment Size	MINERALIZATION — Distribution (Massive, Disseminated, Veinfill, Replacement); Type (Hypogene, Supergene, Ore and Limonite Mineralogy)	STRUCTURE — Down Hole Dist. (m. ft.); Foliation ∢ with core; Bedding ∢ with core; Fracture ∢ with core; Description of Structures (Post or Pre-Ore (Evidence))	Fracture Intensity (No. per metre)	DOWN HOLE SURVEY DATA: Depth (m. ft.); Inclination; Bearing	THIN & POLISHED SECTIONS: Depth (m. ft.); Sample Number
			143.6–152′		ALTERED GNEISS (BANDED)	SAME AS ABOVE, EXC. MINOR VUGGY, DISCONTINUOUS SILICA VNLTS. AVG. <1 MM. (UP TO 10 MM.) WIDE — VUGS IN THESE COMMONLY LINED WITH COLLOFORM WHITE MINERAL, THEN (ON WHITE MINERAL) TINY (<0.1 mm. LONG) EUHEDRAL, WATER-CLEAR QTZ. XLS	SAME AS 122–143.6′	149.2–149.2′: FLT. GOUGE & BX. OTHERWISE SAME AS 122–143.6′			
			152–159′		FAULT GOUGE & BX. (ALTERED)	DEGREE OF COMMINUTION HIGHLY VARIABLE; STRONGLY SERICITIZED TO 158′. SILICA FLOODING W/ BLUISH-GRAY CHALCEDONY (?) 158–159′.	152–158′: 4% PY, SAME AS 122–143.6′; 158–159′: 12% PY IN SILICIFIED ZONE (BANDED 2 mm. SILICA-SULFIDE VNLT. AT 40° TO CORE AXIS, AT 158′	GOUGE & BX.			
			159–171′		ALTERED GNEISS (BANDED)	SAME AS 122–143.6′, BTE. IS ALMOST TOTALLY ALTERED TO WAXY GREENISH CLAY, BUT RELICT BTE. IS LOCALLY PRESENT.	4% PY, SAME AS 122–143.6′	FRACS. SAME AS 122–143.6′			
			171–177.8		ALTERED FLT. GOUGE & BX.	... BLEACHED APPEARANCE, STRONGLY SERICITIZED WITH MINOR SILICA & CLAY	~10% PY, SAME AS 122–143.6′. ALSO <0.1% RESINOUS BROWNISH-RED MINERAL (SP?) TEXTURALLY SIMILAR TO PY, BUT INDIVIDUAL GRAINS SLIGHTLY LARGER	CRUSHED, BRXTD.			
			177.8–185′		ALTERED GNEISS (BANDED)	... SAME AS 122–143.6′, EXC. MORE STRONGLY SERICITIC. SER. INCREASING DOWNHOLE	5–7% PY, SAME AS 122–143.6′	FRACS.: SAME AS 122–143.6′			
			185–188′		ALTERED FLT. GOUGE & BX.	... STRONGLY SERICITIZED	PY, SAME AS 122–143.6′; 185–185.8′: >25%; 185.8–188′: 8–10%				

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GEOPHYSICAL LOGS

CORE SIZE (~~mm.~~ in.)	FROM (~~m.~~ ft.)	TO	LOG RUN	DEPTH (~~m.~~ ft.)	DATE	COMPANY

SHEET No. 5 OF 5

110

SCALE (~~m.~~ ft.)	GRAPHIC LOGS: FRACTURE INTENSITY	(FRACTURES ~~m.~~ ft.)	ALTERATION: CLAY	CHLOR. EPID.	BIO.	SER	KSPAR	SILICA	$CO_3^=$	TOTAL SULPHIDES (vol.%)	ROCK TYPE & STRUCTURE	DOWN HOLE LOCATION: DISTANCE DOWN HOLE (~~m.~~ ft.)	ELEVATION	ROCK TYPE	GEOLOGIC NOTES (Use also for general comments): DESCRIPTION — MINERALOGY, ALTERATION, TEXTURES, GRAIN SIZE, FRAGMENT SIZE	MINERALIZATION — DISTRIBUTION Massive, Disseminated, Veinfill, Replacement	TYPE Hypogene, Supergene, Ore and Limonite Mineralogy	STRUCTURE — DOWN HOLE DIST. (m. ft.)	FOLIATION ∢ WITH CORE	BEDDING ∢ WITH CORE	FRACTURE ∢ WITH CORE	DESCRIPTION OF STRUCTURES Post or Pre-Ore (Evidence)	FRACTURE INTENSITY (#/m PER METRE)	DOWN HOLE SURVEY DATA: DEPTH (~~m.~~ ft.)	INCLINATION	BEARING	THIN & POLISHED SECTIONS: DEPTH (~~m.~~ ft.)	SAMPLE NUMBER
												188–192²		ALTERED GNEISS (BANDED)	SAME AS 122-143⁶	PY, 3%, TEXTURALLY SAME AS 122-143⁶; ALSO POSS. TR. SP.						FRACTURING: SEE 122-143⁶						
												192²–210²		ALTERED FAULT GOUGE & BX.	... DEGREE OF COMMINUTION HIGHLY VARIABLE, SUBANG–ANG. FRAGMENTS, UP TO AT LEAST 75 MM. MAX. DIMENSION, EMBEDDED IN SILICA–CLAY–SER–SULFIDE ROCK FLOUR, IN WHICH RELATIVE PROPORTIONS OF THESE 4 COMPONENTS VARY CONSIDERABLY ALONG THE LENGTH OF THE INTERVAL. FRAGMENTS ARE RICHER IN GREEN CLAY THAN MATRIX. MANY FRAGS. DISPLAY RELICT GNEISSIC TEXTURE	PY, OVERALL ~5%, SAME AS 122-143⁶, EXC. SOME SULFIDE AGGREGATES MAY REACH 15 MM. MAX. DIMENSION						GOUGE & BX; SOME POST-SULFIDE MOVEMENT (SMEARED SULFIDE ON VNLTS.)						
												210²–217		ALTERED GNEISS (BANDED)	SAME AS 122-143⁶, EXC. MORE COARSELY XLINE, MORE DISTINCT RELICT FOLIATION; RELICT BTE. COMMON	PY, SHARP DECREASE FROM 192²–210²; ~2%, TEXTURALLY SIMILAR TO 122-143⁶						FRACS. <5/m.? (DIFFICULT TO DETERMINE — SEE 122-143⁶)						